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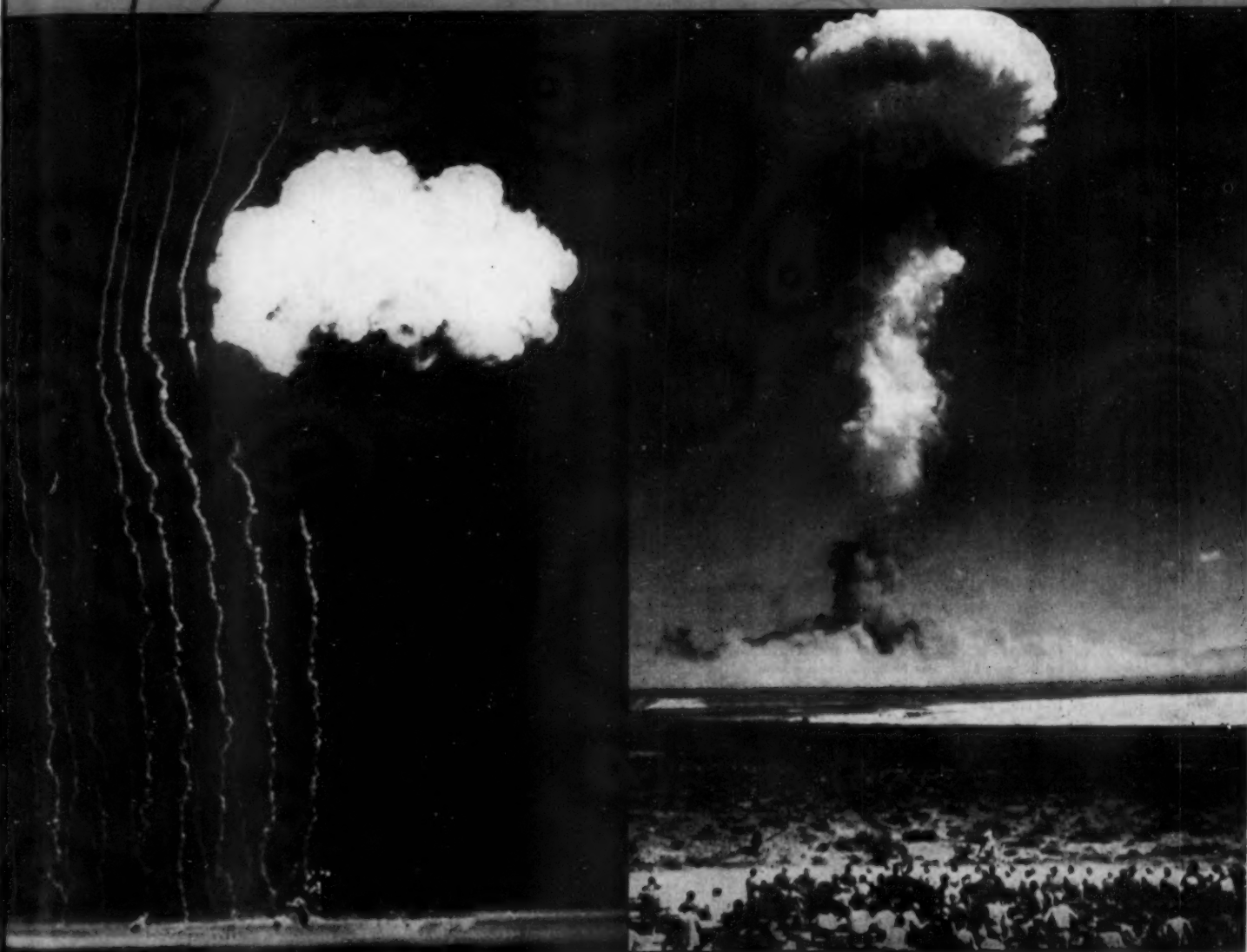
SCIENCE NEWS LETTER

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✓ DETROIT

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Operation Big Shot

See Page 275

A SCIENCE SERVICE PUBLICATION

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VOL. 61 NO. 18 PAGES 273-283

Thunder Hunters



Thunder hunting equipment on location near Madison, Florida. Loop antenna on truck picks up static. The engineer in top picture is watching the indication of a circuit which registers how often the static exceeds a given level.

BELL TELEPHONE LABORATORIES



Improving telephone service for America provides careers for creative men in scientific and technical fields.

Many new telephone circuits have two jobs to do—carrying your voice and transmitting signals to operate dial exchanges in distant towns. And an old-fashioned thunderstorm can interfere with both!

"Rolling static" comes from many storms over a wide area and can interfere with clear telephone talk. A nearby lightning flash makes "crack static" which, unchecked, plays hob with dial system signals.

So Bell Laboratories scientists go "Thunder Hunting" in the storm centers of the United States—"capturing" storms by tape recorders. Back in the Laboratories, they recreate the storms, pitting them against their new circuits. This method is more efficient and economical than completing a system and taking it to a storm country for a tryout. It demonstrates again how Bell Telephone Laboratories help keep costs down, while they make your telephone system better each year.

PHYSICS

We'll Grope in Dark

When atom bomb falls on us, light many times more brilliant than sun will be first warning. Eye witness observations of Science Service representative.

See Front Cover

By HELEN M. DAVIS

Special coverage of the April 22 atom bomb exploded at Yucca Flats, Nev., as written by editor of Science Service's magazine, Chemistry.

► **LIGHT** 10 times in brilliance the glory of the sun may be your first warning of attack by an atomic bomb.

If so, that may be the last vision you will ever have. The blinding flash may never clear from your eyes. You may be left groping in darkness to face the bitter day when nuclear energy is turned against us.

We who saw the A-bomb at Yucca Flats were safe. Hundreds of people in the Atomic Energy Commission, the Sixth Army and the Air Force had worked for weeks to put on a stupendous spectacle in which troops and observers were close but protected.

This will not be the case when an enemy drops the bomb. For us goggles of extra density protected our eyes for those first five seconds till the atomic super sun had cooled to an enormous ball of flame. As this fire dies the familiar shining white mushroom rises from the cinder of dark cloud. The cap of the mushroom is a gigantic smoke ring. Hot gases billow up through the center and cool at the top to form a glaze of ice. Cloud forms curl down over the outside, preserving the ring form. Luminous white, but tinted with yellow and rose, its unearthly beauty gradually fades leaving a cloud scarcely to be distinguished from the cumulus that dots the blue sky.

All this you might see of an enemy's bomb if you were lucky in escaping the first flash, provided you were ten miles away. A considerable number of seconds later the puff of hot air, the sound of the deep boom and the rush of the blast wave arrive together. And after that, some three miles from the bomb's target, an ominous column of black smoke comes up. This time it was a wooden shed. In Hiroshima it was the fire-storm that destroyed the city.

To the military, the atomic bomb is a powerful fire bomb useful for wiping out enemy strong points. To the scientist, the explosion is a test to learn much he would like to know about how atoms behave and why windows sometimes in one nearby town, sometimes another, are lifted out onto the sidewalk by the blast wave. To the ob-

server, it is a beautiful and fearful sight. If you are a victim, that first vision of unimaginable light will probably be yours. Its equivalent is registered on instruments on the blast site. This message is transmitted to the control point in the instant after detonation, before the instrument that saw the flash is vaporized.

To See, Hear and Feel

To see, to hear and to feel at close range the effects of the atomic bomb, civil defense officials and representatives of the many news media perched like animals in a zoo on hillside boulders at News Knob, Yucca Flats, 65 miles north of Las Vegas.

Infantry of a Sixth Army task force, for safety's sake buried themselves alive closer to an atomic blast than any American troops heretofore. Three commanding generals shared foxholes with the men.

Experience gained in previous atomic shoots allowed a clipping of the safety margin for the spectacular show. Troops of the 82nd Airborne Division parachuted into the area just after the bomb exploded.

A line-of-sight short wave radio relay tower was planted by helicopter on a

mountain peak nearby in order to provide a channel for live television coverage of Operation Big Shot.

The annual rainfall of this region is two inches. Half of that fell on the gallery of "big shots" and news representatives as they got their bearings in anticipation of the atomic test.

Over Half Million Have Seen

Over a half million people have witnessed atomic bomb explosions. This is true even though the most recent detonation was only the third "public" demonstration of nuclear weapons in the seven years they have existed.

The two bombs dropped in war were seen by about 450,000 inhabitants of two Japanese cities, almost half of whom became casualties. In most of the other 26 atomic explosions known to have occurred in history up to the April 22 test, there have been sizable audiences, ranging up to the 42,000-man task force at the 1946 Bikini tests. Three of the 26 earlier test explosions are credited to Russia. U. S. atomic bombs have been exploded as follows: One at Alamogordo, two in Japan, two in Bikini, six at Eniwetok and 14 at the atomic testing grounds on Nevada's wasteland near Las Vegas.

The test atomic explosions have been peculiarly man's work. The bomb of April 22 was viewed by only a few feminine eyes, among the press, civilian defense and A. E. C. observers. A few A. E. C. women have seen earlier tests. The civilian observers were not as close to the bomb as some of



A-BOMB BLAST VIA TV—Snapped at the time the Operation Big Shot A-bomb was detonated, this picture shows the light flash that an estimated 12,000,000 television viewers all over the country saw on their TV sets.

the military forces brought in for atomic training but they had a closer view than any but the military and the AEC experts. Not since Bikini had reporters had such mushroom cloud ringside locations.

The energy unleashed by the atomic bomb is large compared with the power that runs our modern civilization. The plutonium in an atomic bomb liberates through fission nearly twenty million times as much energy as the explosion of an equivalent weight of TNT. The immense power of Boulder Dam produced during a month will be equalled approximately by an average atomic blast, and the April 22 blast was larger than average.

To keep these man-made energy sources in proper perspective, we must recall that the energy of a nominal atomic bomb is about the same as that of the sun's rays

falling on about a hundred square miles of ground during an average day. A strong earthquake has as much energy as a million atomic bombs.

Shown on the cover of this week's SCIENCE NEWS LETTER are two photographs taken during the Operation Big Shot atomic bomb burst. On the left, the fireball rises into the air. The smoke streamers to the left of the fireball are from measuring rockets. On the right, observers watch from a safe distance as the fireball of the atom bomb dissolves into a doughnut-shaped ring, colored a luminous white tinged with yellow and pink. The yellow on the west side is from the nitrous oxide, which is an expensive form of nitrogen fixation. The pink on the east side looked like the rose-colored strontium flame, but it may have been a refraction effect.

Science News Letter, May 3, 1952

the mirrored surface, the relative humidity of the air over the grain is easily found.

Apparently this hygrometer works with almost any grains or grain combinations, Dr. Ives has reported. It can help the farmer judge when to start work with a field baler, hay chopper or combine and when it is safe to stop running his hay or grain drier. Accuracy of the described instrument is within one-fourth of one per cent of the moisture in the grain.

The instrument is not on the market now, but Dr. Ives and the Institute hope that some manufacturer will soon start producing it.

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AGRICULTURE

Less Grain Spoilage

► LESS GRAIN spoilage during storage is foreseen through the use of a glass-fruit-jar, moisture-telling device developed at the Inter-American Institute of Agricultural Sciences in Turrialba, Costa Rica.

Molds of one kind or another often develop on grains being stored. If the humidity is high, the molds may develop within a few days, and as little as a 10% drop in the moisture content of the air surrounding grain may make the difference between a storage period of about a week or a year or more.

Now Dr. Norton C. Ives has developed a quick indicator, easy for farmers to use, that will tell in a hurry just what is the moisture content of the air around grain in storage.

The bottom half of a two-quart fruit jar is filled with a sample of the grain being tested. Time is then allowed for the air above the sample to reach equilibrium with

the moisture in the grain and surrounding air spaces. This takes at least half an hour, but the reading for moisture content can be made in about three minutes.

The fruit jar has an especially built top which is actually a dew-point hygrometer, working on the same principle as the instrument used by meteorologists to tell the amount of moisture in the air.

A liquid with a low evaporation point, such as acetone, often an ingredient of nail polish removers, is poured into a thin metal tube in the special cap. Air is then forced through this refrigerant to hasten evaporation. Part of the outside of the thin metal refrigerant tube is chromium-plated and mirror-polished. It thus reveals the instant when dew begins to form.

A precision thermometer is placed in the refrigerant and another in the grain. From the difference in these two temperatures at the time when dew began to form on

Question Box

ACOUSTICS

How can noise on airfields lead to plane crashes? p. 278.

ASTRONOMY

What atomic bomb element has been found in the stars? p. 278.

FOREST PATHOLOGY

What are two effective methods for fighting oak wilt? p. 282.

GENERAL SCIENCE

What would be the function of a taxpayers' advocate? p. 283

Photographs: Cover and p. 275, United Press Telephoto; p. 277, Consolidated Vultee Aircraft Corp.; p. 279, National Bureau of Standards; p. 282, Ohio Agricultural Experiment Station.

ICHTHYOLOGY

How does the weather affect the number of fish you catch? p. 281.

MEDICINE

What trends have been found in children of A-bomb victims? p. 280.

OCEANOGRAPHY

What is the largest solar tide yet measured? p. 278.

TECHNOLOGY

How will front-line phones of the future "ring"? p. 286.

NATURAL RESOURCES

Oil in Northern Alaska

Vast reserves of oil and natural gas lie under the permanently frozen ground of northern Alaska, about 150 miles from an ice-free coast.

► HUNDREDS OF millions of barrels of oil and large amounts of natural gas are under the ground in northern Alaska, SCIENCE SERVICE learned.

The recent drilling of 31 test wells has shown that the area north of the Brooks Range up to the northern coast of Alaska may well prove to be one of the great oil basins on American soil. Extensive work has been done in the last four or five years by both the U. S. Geological Survey and the Navy on what was already recognized, superficially, as promising prospecting territory.

However, you had better not pack your prospecting instruments and set off up the Alcan Highway tomorrow. All of the possible oil fields are well within the Naval Petroleum Reserve Number Four, off limits to private development.

Estimates of the amount of oil and natural gas in this basin are based on wells which have actually produced both products. Measurement of the rate of production of these wells enables geologists and prospectors to make a rough guess as to the size of the oil fields below the wells.

One indication of the worth of the oil basin is to compare it with the rich new Alberta, Canada, fields. It was not until 215 wells were drilled that oil was actually found there. On the arctic slope of Alaska, prospectors found one large oil field with four wells at Umiat, one small field with two wells at Simpson, one well with unknown reserves at Fish Creek and five gas wells in three fields. All this was done by drilling only 31 test wells, as contrasted with the 215 in Alberta.

The Umiat field seems to be the best discovered so far. On the basis of oil already produced there, geologists estimate that 30,000,000 to 100,000,000 barrels of oil are in that field alone.

The most promising area, from a geological standpoint, has not yet been test drilled. This is in the foothills, just to the north of the Brooks Range and south of the area where the 31 test wells have been drilled. If test wells, soon to be drilled there, live up to their promise, experts say, there will be fields in the foothills bigger even than Umiat.

Despite the cold and the permafrost, experts believe this oil will be relatively easy to get at. In such temperatures, the "pour point" of the oil is the important factor. The oil in Umiat is still pourable down to minus 15 degrees Fahrenheit. That at

Simpson is not so good—its pour point is plus 25 degrees.

The wells are generally 150 miles from an ice-free coast and pipe lines could easily be built for this short distance.

When the fields in this vast area are all delineated, experts believe, hundreds of millions of barrels of oil will be added to the nation's 20 billion barrels of oil reserve already discovered.

Science News Letter, May 3, 1952

RADIO

Some Radio Storms Have Well-Defined Centers

► WHEN SHORT-WAVE signals on your radio are disturbed by weak signals and fading, the chances are that radio hams and others listening to short-wave broadcasts as far as a thousand miles away likewise are having trouble with reception.

Some radio storms have well-defined centers 1,200 to 2,000 miles across, R. S. Lawrence of the National Bureau of Standards'

Central Radio Propagation Laboratory has found. Such areas of disturbed reception move across the North American continent, but at an unpredictable rate and direction, he reported.

Contour maps showing the reflecting power of the "radio roof" 200 miles above the earth during four recent radio storms were displayed by Mr. Lawrence at the joint meeting of the International Scientific Radio Union and the Institute of Radio Engineers in Washington.

These contour maps, perhaps the first ever based on radio disturbance, showed the density of the atmosphere's reflecting layer at two-hour intervals. The usual daily variation between day and night was eliminated from the map by actually plotting how far the density deviated from the monthly average at that particular time of day.

The atmosphere's reflecting power at 13 stations in North America was considered in making the contour maps. The stations ranged from Trinidad and St. Johns in the east to San Francisco and Prince Rupert in the west. The North American continent was chosen because of the existence of this group of evenly-spaced stations and the ready availability of the data.

"The very fact that smooth and regular contours can be drawn on these maps," Mr. Lawrence stated, "indicates both that the data are accurate enough for the results to be significant and that the storm characteristics are not so highly localized as to change completely in the distance between observation stations."

Science News Letter, May 3, 1952



FIRST TIME ALOFT—The new, eight-jet YB-60, built by Convair, is shown as it took off on its first test flight. The swept-wing bomber, an experimental all-jet version of the B-36, flew for one hour and six minutes. In this flight picture, the only one cleared for release by the U. S. Air Force, the landing gear has been eliminated by retouching.

ASTRONOMY

A-Bomb Element in Stars

Surprising discovery of technetium in spectra of red, S-type stars poses problem concerning its half-life, fairly short for earth-known forms.

► **TECHNETIUM**, the first chemical element to be discovered through atomic bombardment, is now known to exist in the stars.

Several lines of technetium have been identified in the fanned-out light of red S-type stars, Dr. Paul W. Merrill of Mount Wilson and Palomar Observatories told the National Academy of Sciences meeting in Washington.

"It is surprising to find an unstable element in the stars," Dr. Merrill stated. This may indicate one of several things:

1. A stable form of technetium actually exists although it has not yet been found on earth.

2. These stars rich in the little-known heavy elements zirconium and barium somehow produce technetium as they go along.

3. The S-type stage of stellar existence is relatively short.

Technetium is an explosion product of the atomic bomb. Also known as element 43, it was first identified in a piece of molybdenum that had been bombarded with neutrons in the University of California cyclotron at Berkeley. Today it is most plentifully obtained as a product of the splitting of uranium atoms in AEC nuclear reactors at Oak Ridge, Tenn.

Samples of this rare element, obtained from Oak Ridge, were heated at the National Bureau of Standards to produce its typical spectrum, and compared with the sun's rainbow colors. Dr. Charlotte E. Moore-Sitterly, working with Dr. W. F. Meggers in the Bureau's spectroscopy laboratory, found at least one identical line in both spectra. This indicates that technetium probably exists in the sun.

Photographs taken by Dr. Merrill with the 100-inch telescope and others taken recently by Dr. I. S. Bowen with the 200-inch telescope show several technetium lines in the spectra of S-type stars. This is particularly true of certain variable stars which regularly take about a year to increase and decrease in brightness, Dr. Merrill reported.

The bothersome problem about the existence of technetium in the sun and other stars is that the period of existence (called "half-life") of any kind of technetium known here on earth is relatively short. It is measured in mere hundreds of thousands of years, a short time for material in a star. If a longer-lived form of technetium were discovered on earth, it would fit into the picture better.

Science News Letter, May 3, 1952

OCEANOGRAPHY

Sun Tides At Tahiti

► **THE MOON** is largely responsible for the daily rise and fall of most tides, but there are at least two places where the waters rise and fall with the sun, Rear Adm. L. O. Colbert, formerly director of the U. S. Coast and Geodetic Survey, stated at the Smithsonian Institution.

"Although there is a slight variation, in minutes only," Adm. Colbert stated, "we have at Tahiti the unusual feature of high water coming at noon and at midnight, and low water at six in the morning and evening."

"The tide at Tahiti has a small range—on the average of 0.8 feet—so that it is not very impressive," he continued. "More recently a larger solar tide has come to light on Tuesday Island, a small island in Torres Strait about 15 miles from the northern point of the Australian mainland. Here the tide has a mean range of a little over three feet, but comes about the same time day after day."

The geographic land boundaries or sub-

merged ocean features which outline these tidal basins are oriented so that the waters in the basins feel the minimum effect of the moon, but get the maximum effect of the tide-producing force of the sun.

All along the coast of North America from Halifax in Nova Scotia to Cape Canaveral in Florida, and around to the Bahamas, at about the same distance off the coast high water occurs at approximately the same time each day. These tides are governed by the moon, not the sun. High tide occurs every 12 hours and 25 minutes sun time, or exactly every 12 lunar hours.

Six or seven hours after the moon passes over the local meridian, the oscillation of the water brings high water to these regions. But the maximum height of the tide is far from the same. For the outer coast of Puerto Rico, the rise and fall is one foot; for the Bahamas, two feet; and for the Georgia coast, six feet.

Near Anchorage, Alaska, a difference of 35 feet between high and low tide has been

noted. This is not a tidal bore, Adm. Colbert pointed out, but a real range of the tide. This great range is due to its position at the head of a great inlet, located at the end of the major Pacific tidal basin. Just as in a bathtub water sometimes sloshes out at the two ends, so the tides are higher at the ends of a tidal basin.

Science News Letter, May 3, 1952

MEDICINE

Heparin Improves Angina Patients

► **"DRAMATIC IMPROVEMENT"** in 80% of a group of patients with the heart disease, angina pectoris, was achieved by twice-weekly injections into the veins of the anti-clotting drug, heparin, Dr. Hyman Engelberg of Los Angeles reported at the meeting of the American Heart Association in Cleveland.

The drug was given not because of its anti-clotting action but because of its effect on the fatty protein particles found in the blood of some patients with artery hardening and on fat metabolism in the body. Heparin had previously been shown effective in preventing fatty degeneration of the arteries in rabbits.

Relief of pain in the angina patients and increased ability to tolerate exercise in patients with blood vessel disease were among the good results reported.

Science News Letter, May 3, 1952

ACOUSTICS

Noise on Airfields Leads to Plane Crashes

► **EXCESSIVE NOISE** on airfields can lead to plane crashes, Lt. Col. Alvin F. Meyer, Jr., of Wright-Patterson Air Force Base, Dayton, Ohio, warned at the Industrial Health Conference in Cincinnati.

The danger comes in the effect of the noise on control tower personnel. Col. Meyer gave one example of a ground accident which destroyed one plane and seriously damaged another. Cause of this accident was traced to wrong instructions issued by the control tower.

"An investigation and special physical examination revealed that half the operators showed symptoms of excessive fatigue, irritability and vague psychosomatic responses despite the fact that they had all satisfactorily passed the annual physical examination six months before," Col. Meyer reported.

"Further investigation of environmental conditions proved that there was an excessive noise level in the control tower."

More careful airfield zoning, better regulation of warm-up and maintenance areas and proper master planning of airfield installations are needed, he declared, to help reduce airplane accidents.

Science News Letter, May 3, 1952

ANTHROPOLOGY

Technology Impact Found in Remote Places

► THE AGE of the jet plane, radio, and atom bomb has its impact on daily life, not just in America but in villages in Thailand and Burma and other remote communities as well.

The same general pattern of social change is being followed in six widely separated and different communities, Dr. Alexander H. Leighton, anthropologist of Cornell University, reported to the American Philosophical Society meeting in Philadelphia.

The tendency is away from local horse-trading to a cash economy which makes the individual more dependent on the nation. A similar drift is taking place from the local autonomy of the town meeting or its equivalent to dependence upon higher authority.

A sharp line is being drawn between religion and other activities. This is true in India as well as in New England or the mountains of Peru.

Values and ideologies are changing, too. Everywhere a break is being made with traditional values, and local ideas are becoming more and more influenced by outside forces. The ideas, however, are not in harmony with economic and governmental trends and neither are they consistent one idea with another.

The communities studied by independent anthropologists, working in collaboration are located in: rural northeastern America, Navaho Reservation, Peru, Thailand, Burma and India. The time covered was from 1900 to 1950.

Science News Letter, May 3, 1952

MEDICINE

Human Cancer Tissue Grown in Hamsters

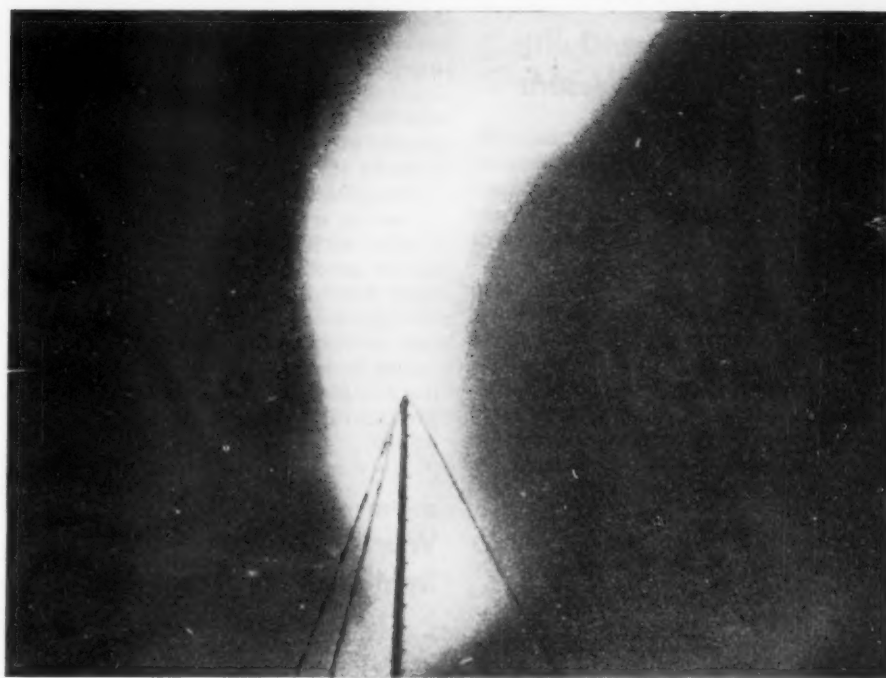
► IMPORTANT NEW knowledge about cancer and the chemical factors involved in cancer growth is expected to come from the cheek pouch of the golden hamster.

The reason is that scientists have now succeeded in transplanting tissues from 50 human cancer patients into the hamster's cheek pouch where they can easily examine the transplanted cancer and remove bits of it for further examination and study without sacrificing the animal.

The method for successful transplantation of human cancers to hamster cheek pouches is reported by Drs. H. M. Lemon, B. R. Lutz, R. Pope, L. Parsons, A. H. Handler and D. I. Patt of Boston University and Evans Memorial and Massachusetts Memorial Hospitals in SCIENCE (April 25).

Non-cancer tissues remain in the cheek pouch for long periods, up to 74 days, but do not grow. The cancer tissues, however, grow and can be subtransplanted.

Science News Letter, May 3, 1952



RADIO PROBES AURORA—Here silhouetted against an aurora is one of the radio antennas used by National Bureau of Standards' scientists to study the effect of northern lights on radio propagation. The brighter the aurora, the higher the radio frequencies that can be reflected by the ionized layers.

RADIO

Auroras Mark Reflections

► NORTHERN LIGHTS, pulsating streamers or curtains of soft colored lights occasionally seen from the United States, signal the location of a temporary "radio roof."

The brighter the aurora, the higher the radio frequencies that can be reflected by this temporary reflecting layer, R. W. Knecht of the Central Radio Propagation Laboratory reported at the joint meeting of the International Scientific Radio Union and the Institute of Radio Engineers in Washington.

In the region of the atmosphere where the auroras shine, the electrons are knocked off from many atoms and the ionized layer thus formed reflects radio waves back to the earth.

At night this region is 60 to 75 miles above the earth, the same height as one of the sunlit layers that bounce radio waves back to the earth during the day. It is lower than the normal night-time radio roof. Radio signals greater than five megacycles normally penetrate the lower layer during the day, but during an overhead aurora signals up to ten megacycles and above may be reflected.

During March of last year, Mr. Knecht was at Point Barrow, Alaska, where an aurora is nearly always visible. From here he searched the sky for northern lights,

determined their position and relative brightness, and simultaneously sent radio signals up into the ionosphere to check the height of the radio reflecting layer.

Simultaneous observations were made every 15 minutes during the dark hours of ten successive clear nights. Mr. Knecht completed about 400 in all. Auroras were present during about nine out of ten of these observations.

When inactive auroras were spotted 45 degrees or higher above the horizon, Mr. Knecht found that radio echoes were returned by an additional layer located below the normal night-time reflecting layer. Radio physicists call this layer "sporadic E." Auroras directly overhead enabled him to determine the apparent height of the reflecting auroral layer.

Intense auroral activity is closely followed by a sharp increase in radio wave absorption, often strong enough to black-out most broadcasts, Mr. Knecht reported.

Science News Letter, May 3, 1952

The oldest alligator on record lived 56 years.

The common shrew will starve to death in two or three hours unless food is obtainable; it eats twice its own weight of food each day.

MEDICINE

Real Broken Heart From High Blood Pressure

► THE TYPE of person likely to suffer an actual broken heart was described by Drs. Stanford Wessler, Paul M. Zoll and Monroe J. Schlesinger of Boston at the meeting of the American Heart Association in Cleveland.

He, or she, is the kind of person who has high blood pressure or makes excessive exertion and suffers a particular kind of heart damage.

They made a careful study of 20 broken hearts, or ruptured hearts to use the medical term. The causes they found had no apparent connection with the romantic or sentimental causes popularly said to break hearts.

Rupture, or break, of the heart usually comes, they found, between the fourth and eleventh day of an acute attack of the kind of heart damage called myocardial infarction. This means an area in the heart muscle has solidified and died from anemia because of obstruction of the blood supply to that area.

When a heart blood vessel gets an acute block and infarction develops across the heart wall in a region poorly supplied by other blood vessels and unprotected by scar tissue, the groundwork is laid for rupture. But even with this ready-to-break state, the heart may not break unless high blood pressure or excessive effort occur during the acute infarction. The reverse is also true, the doctors found. High blood pressure and excessive effort do not produce rupture unless the heart has already suffered the damage readying it for a rupture.

Science News Letter, May 3, 1952

AERONAUTICS

Jet Propulsion Goes From Military to Civilian Use

► JET PROPULSION of airplanes passed from military to civilian use in London on May 2 when the British Comet Jetliner went into regular service. This 36-passenger transport is the world's first airliner powered with turbo-jet engines, the type now used in the speedy fighters and bombers of military services.

Over two years have elapsed since a British airliner propelled by jet power started flight tests. British engineers now feel assured that jet propulsion is suitable for civilian planes, particularly for long flights where speed is an essential. Over a year ago a British jetliner made a non-stop flight of 2,200 miles from London to Cairo in 5.5 hours, half the time required for piston-type transports.

Canada also has a jetliner which has made many test flights during the past year, including several to cities in the United

States. The United States has no jetliner although several airplane manufacturers have developed designs and are ready to begin construction when the proper moment arrives. It does have several heavy bombers already in service which are propelled entirely by jets.

The British jetliner now going into regular service will be used on the route from London to Johannesburg, South Africa. It cruises at 500 miles an hour, or 50% faster than conventional liners now in service. Speed is not its only advantage. Its lack of vibration gives passenger comfort not to be found in airplanes with conventional engines. Lack of noise in its passenger cabin is another advantage of the new jetliner.

Science News Letter, May 3, 1952

CHEMISTRY

War of Fibers Pits Synthetic vs. Natural

► A WAR of the fibers is on. New synthetic textiles have their backers. Traditional cotton, wool and silk have theirs. Unique usefulness is claimed for the new fibers. Champions of cotton, wool and silk say these old, dependable fibers will always meet the major needs of most people.

Dacron, orlon, nylon, acrilan and dynel are the truly synthetic fibers, Joseph B. Quig, manager of textile research for the Du Pont Company's Textile Fibers Department, reported to the American Chemical Society in a recent round-up of information.

Vicara, said Dr. Quig, the fiber made from zein, the protein of corn, has many qualities which relate it to that group.

Dynel resists chemicals and flames. Acrilan and orlon resist sunlight, and have exceptional bulk. Dacron's resilience and nylon's strength will win special places for them in clothing, said Dr. Quig. He believes that the new synthetics have introduced a new dimension into fabrics.

"Viscose rayon is still king of man-made fibers," said Julius B. Goldberg, director of research of J. P. Stevens and Co., New York. The fact that about a billion pounds of viscose rayon were used in the United States in 1951 is proof in his opinion that in both quality and price this material meets the needs of the people.

Acetate enjoys a price advantage among textile fibers, said Ashton M. Tenney of A. M. Tenney Associates, New York. There have been recent improvements in dyeing and finishing acetate fiber.

On the side of traditional textiles, Werner von Bergen of Forstmann Woolen Co., Passaic, N. J., defended wool as essential for winter-weight fabrics. L. K. Fitzgerald of Dan River Mills, Danville, Va., praised cotton as the "work-horse" among fibers, and W. S. Kilborne of William Skinner and Sons, New York, outlined the way scientific thinking should be applied to the problems of silk.

Science News Letter, May 3, 1952

IN SCIENCE

MEDICINE

Leukemia and Abnormalities Show in A-Bomb Children

► A DEFINITE trend toward more leukemia, and slightly more mutational abnormalities in children of those residents of Hiroshima and Nagasaki who got large doses of irradiation from the atomic bombs has been found in studies of the Atomic Bomb Casualty Commission.

A marked increase in cataracts occurred in persons who were within 1,000 meters, or about two-thirds of a mile, of the bomb's hypocenter.

These findings were reported at the Industrial Health Conference in Cincinnati by Dr. John C. Bugher, deputy director of the Atomic Energy Commission's division of biology and medicine.

No noteworthy effects on general fertility of the bombed populations were recorded once the immediate period of radiation sickness had passed.

Several years will be required before final conclusions of the effects of the irradiation on the atom bombing survivors can be drawn, Dr. Bugher said. Many more years, he added, will be needed to determine the effects on longevity and genetic changes.

Science News Letter, May 3, 1952

PUBLIC SAFETY

New Insecticides Held Safe When Properly Used

► BANISH YOUR fears about getting sick from the new insecticides and learn to use them properly, is the advice of Dr. William F. Durham, biochemist of the U. S. Public Health Service Communicable Disease Center at Savannah, Ga.

The newer insecticides have not proved any more poisonous than nicotine under practical conditions and have a good safety record when compared with the older poisons still in use, he reported at the Industrial Health Conference in Cincinnati.

Current evidence shows that "human poisoning by modern pesticides, or insect poisons, always involves extensive exposure," he stated.

"Considering that insects cause an annual loss of four billion dollars in the United States alone and that \$54 are saved for every dollar spent on insecticides, pesticides are here to stay and we would do well to learn to live with them safely," he stated.

"The hazards presented by the new insect poisons are not alarming but deserve our best efforts toward reduction."

Science News Letter, May 3, 1952

SCIENCE FIELDS

GENERAL SCIENCE

Fitting Men to Machines Creates Science Frontiers

► BUILDING MAN up so that he can keep pace with the machines he operates has opened new frontiers in modern science, Dr. Hugh L. Dryden, director of the National Advisory Committee for Aeronautics, told the American Philosophical Society meeting in Philadelphia.

He stated that man's unchanging performance creates new problems as the performance of machines increases. Man's vision is not adequate and must be extended by electronic radar-eyes. His physical strength must be supplemented by mechanical or electrical power.

His body must be protected from thin atmospheres by pressurized suits or pressurized airplane cabins. He must be kept within tolerable limits of temperature and humidity. The noise level that surrounds him must not get too high, or else his efficiency will be impaired.

With the coming of faster-than-sound aircraft, man's ability to react to sudden unforeseen crises has become inadequate in many cases. Mechanical aids have been developed to help him under these conditions.

Man's own limitations have led to new developments in technology and in the physical and biological sciences, Dr. Dryden said. His limitations have created new frontiers to be crossed.

Science News Letter, May 3, 1952

GENERAL SCIENCE

Youthful Scientists Exhibit Next to Famous Collections

► EXHIBITS of a new kind will be installed in the Smithsonian Institution's National Museum May 8, 9, and 10.

Between 30 and 40 high school age boys and girls from all over the nation will display the results of their scientific endeavors. Geological, insect and other collections which won for the boys and girls the right to come to the National Science Fair will be set up where similar, but world-famous, collections have been gathered together through the years by leading scientists. In addition, exhibits embracing physical and chemical concepts will be shown by some of the boys and girls.

Their presence will be as a result of victory in local science fairs all over the nation. The National Science Fair is sponsored by leading newspapers from Los Angeles to Providence, together with Science Clubs of America and SCIENCE SERVICE.

The Smithsonian's retiring secretary, Dr. Alexander Wetmore, himself an outstanding ornithologist, welcomes the boys and girls in these words:

"The Smithsonian Institution welcomes the youthful exhibitors to this year's Science Fair, fully realizing the need for encouraging high school students to develop their interests early in life.

"The work of SCIENCE SERVICE is vital to the future of science. It produces a two-fold effect as it encourages many eager young minds to enter advanced studies in science and, at the same time, increases the larger number of those who understand it and can intelligently support its programs.

"We are pleased to have your exhibitors as guests in our Museum."

Science News Letter, May 3, 1952

PUBLIC HEALTH

Special Study Will Help Stop Colds

► IF YOU "catch cold" this spring, as many persons do, better see your doctor.

For one reason, your sniffles and stuffy head may be early hay fever or rose fever as it used to be called. For another reason, if it is a cold your doctor can help you.

To be sure, there is no single, sure-fire medicine or treatment that will prevent or cure all colds. But one physician, Dr. Marshall C. Cheney of Berkeley, Calif., thinks it is not necessary for doctors or patients to take a defeatist attitude about colds. Writing to fellow physicians in GP (March), published by the American Academy of General Practice, he says:

"With attention and careful follow-up until colds are controlled, it is my experience that complete freedom from colds can often be provided. Certainly their severity and duration can be reduced to the point where occupation and everyday life are not discommoded and no special treatment is needed as long as the individual adheres to his own special regimen."

Dr. Cheney points out that there are many causes for the symptoms labeled as "common cold." He states there are "57 human varieties of infection," ranging from viruses through bacteria such as pneumococci and streptococci to fungi.

For some of these infections there are remedies. The wise doctor will not prescribe antibiotics or sulfa drugs at the first sign of a cold, but he will be alert to signs of other infections where they may be useful.

Finally, Dr. Cheney says, the person who is especially susceptible to colds can be helped to avoid many of them if his doctor studies his case carefully and prescribes for him as an individual. The same methods will not help all people with colds but your own doctor, Dr. Cheney thinks, can find the ones that will help you even if they are different from the ones that help your neighbor.

Science News Letter, May 3, 1952

VETERINARY MEDICINE

Cattle Disease Flare-Up Shows Need of Research

► THE LATEST outbreak of the dread foot and mouth disease of cattle in Ormiston, Saskatchewan, hit within less than 50 miles of the U. S. border, closer than any previously known occurrence to the north.

Discovery of 22 virus-infected cattle so near the U. S. emphasizes the constant danger to which this country is exposed from the plague, yet no research work is being done here to fight the disease.

Cattle raising and dairying are multi-billion dollar industries, and disease knows no borders, but suitable facilities for learning more about the virus to insure that it never does strike within the U. S. are lacking.

A law authorizing construction of a virus laboratory was passed four years ago, but so far no funds for building have been appropriated by Congress, although three bills to provide the money have been introduced.

Estimated cost of such a laboratory is \$25,000,000. Although Canada has not required financial aid in the current slaughter-and-eradicate campaign, the U. S. has spent over \$100,000,000 cooperatively with Mexico in bringing the cattle disease under control there and keeping it out of the U. S.

Science News Letter, May 3, 1952

ICHTHYOLOGY

Fish Bite—Or Don't Regardless of Weather

► FISH PAY no attention to the weather. Whether the barometer is up or down has nothing to do with how many fish you will catch.

Several scientists have tried to find relationships between weather phenomena and fishing, but none of them have been successful. Dr. George W. Bennett, aquatic biologist, State Natural History Survey Division, Urbana, Ill., tried to match up a 12-year creel census from a private fishing club with changes in barometric pressures. After about six months of work he found there wasn't any relationship.

Dr. Edwin L. Cooper, of Michigan's Institute for Fisheries Research, after looking over the results of 4,000 individual fishing trips, said that "fishing was about as good when the barometer was falling as when the barometer was rising."

James G. Sieh and John Parsons made an attempt in Iowa to correlate wind direction, wind velocity, sky cover or cloudiness, and thundershowers or rain with fish activity. They couldn't do it.

This meteorological report to the nation's Izaak Walton's appears in the BULLETIN OF THE AMERICAN METEOROLOGICAL SOCIETY (April).

Science News Letter, May 3, 1952

FOREST PATHOLOGY

Oak Wilt Menaces Forests

Fungus-caused disease threatens the sturdy oak, source of lumber supply for many uses. Chances for control of oak wilt are good if prompt action is taken.

By ANN EWING

► OUR STURDY oaks are wilting away. And this is literally true. The disease known as oak wilt is attacking the source of our lumber supply for such uses as flooring, beams for mine props and houses, and railroad ties, as well as for furniture.

Oak wilt is caused by a fungus. Infected trees are fairly easy to spot from airplanes in the summer time—the dead and dying trees make a brown patch in an otherwise green foliage.

The disease spreads to nearby trees through intermingling of roots of red oak with red oak, and to a less extent perhaps of white oak with white oak. But how the vicious killer jumps long distances to attack trees in untouched areas is still a mystery.

To find a solution, scientists in most of the 17 states where infected trees have so far been found and at the U. S. Department of Agriculture are trying to learn more about the fungus in their laboratories. And forest specialists have been alerted to watch for dull green or brown leaves on oak trees. Some trees have been known to lose nearly all their leaves within a month of becoming infected.

Prompt Action Needed

"With prompt action, chances for control of this dread forest disease are good," Dr. Curtis May of the Department of Agriculture and advisory member of the National Oak Wilt Research Committee states. This committee, composed of representatives of lumber-using industries, in 1951 started an intensive three-year research program to find ways of combating the disease. Headquarters for the group is in Memphis.

To date there are two known methods of fighting oak wilt. When the infected tree is somewhat separated from other trees, such as those used for shade around homes and in parks, the usual method is to cut a very deep trench around the tree, thus severing the disease-carrying root connections. Timing is important in this method, for the roots must be cut before the infection has spread through them to nearby trees. Sometimes two of the deep trenches are dug around the infected area, just to insure checking the spread.

The other effective method of combating the spread of oak wilt is to poison the

healthy trees in a ring around the diseased tree. This can be done where the individual trees that will be killed off are of relatively little economic value.

One-third of the standing hardwood timber in the eastern United States is oak. The acorns from these trees are staples in the diet of such wildlife as deer, squirrels, wild turkey and bear.

Although much of oak's reputation is built on white oak, there are 84 known species of the tree in this country. Numerically and economically, the oaks are our most important hardwoods. Georgia, Illinois, West Virginia and Connecticut have species of oak for their state trees.

The oak wilt fungus, previously known as *Chalera quercina* Henry, is "two-faced." The ordinary, or imperfect, form has been known since 1944. Then, last year, both in the laboratory and later in nature, the perfect stage of the fungus was found. The perfect stage for the fungus is one which carries it over the period when it might otherwise die.

Dr. T. W. Bretz of Agriculture's Experiment Station in Columbia, Mo., discovered the ascospore, or sexual, stage of the fungus in the laboratory.

Two alert young plant pathologists, George Stessel and Bert Zuckerman, of the Illinois Natural History Survey, found the same stage on a dead oak tree in Peoria, Ill., the first time such a stage had been seen growing naturally on diseased oak trees. They noted very minute droplets of the sticky white substance that is one characteristic of the ascospore stage. The finding of this stage may explain how the oak wilt jumps long distances—birds or insects could become smeared with such spores and carry them to far-away trees.

Finding the perfect stage of the fungus both in nature and in the laboratory means that the fungus will be renamed, *Endoconidiophora jagacearum*.

Red oak trees inoculated with the disease die within a few weeks or months after injection. The fungus may kill by plugging the tree's circulatory system. If this is true, researchers suggest that the wilting symptom of the disease might be explained largely by lack of water. No oak trees have yet been discovered that are immune to the fungus blight.

The disease was first found in Wisconsin, Minnesota and Iowa, then Missouri, Illinois and Indiana. Since then it has fanned out to cover a total of 17 states, from Pennsylvania to Arkansas and to North Carolina, covering a large percentage of the area where oak is the common species. In some of the infected states, however, only one or just a few diseased trees



OAK WILT DISEASE—A microphotograph of the oak wilt fungus taken by scientists at the Ohio Agricultural Experiment Station.

have so far been spotted, thus making the chances for control good.

Forest pathologists estimate that the disease has been present in the United States perhaps 25 to 40 years, although the fungus causing it was not isolated until 1944. If the killer were native to the United States, all oak trees would probably have been dead long ago. The infection in the Ozark region is believed to be about eight to ten years old, having been ravaging there for some time before it was identified as oak wilt.

Science News Letter, May 3, 1952

ASTRONOMY

Spot 1952's Fourth Exploding Star

► THE FOURTH exploding star to be spotted this year by Dr. Guillermo Haro, director of Mexico's National Astrophysical Observatory, Tonanzintla, Puebla, has just been found in the southern constellation of Scorpius. The nova is of the 11th magnitude and thus quite faint. News of its discovery has just reached Harvard College Observatory, Cambridge, Mass., clearing house for astronomical information in the western hemisphere.

Science News Letter, May 3, 1952

GENERAL SCIENCE

Conant Wants Taxpayers' Advocate to Fight Projects

► A TAXPAYERS' advocate in the Defense Department, who would provide forced opposition to new projects, would insure that the taxpayers' money would be more wisely spent, according to Harvard President James B. Conant.

In the third of a series of Bampton Lectures at Columbia University in New York, Dr. Conant said: "There should be arguments against the proposal, they should be vigorous but candid; a technical expert should speak on behalf of the taxpayer against each large proposal."

With opposing briefs, arguments, and cross-questioning, he went on, many facets of the problem would be brought out into the open. Dr. Conant suggested that the opposition expert be either a civilian or a retired officer.

Dr. Conant pointed out that such procedures for balancing the bias of technical men, particularly scientists turned inventors, have been worked out almost without plan in the successful industries of this nation. He advocated similar methods of operating in other areas, including the government.

In government, he said, they are particularly needed because government has entered research and development on a very large scale indeed.

Science News Letter, May 3, 1952

GENERAL SCIENCE

Seeds of Future Progress

Although often rejected by scientists who prefer to cling to existing modes of thought, unorthodox ideas can be basis of progress.

► STRANGE AND unconventional new ideas in science, greeted with hostility by most scientists, may actually contain seeds of future progress. But the hurdle of the acceptable and the orthodox in science can be counted on to screen out all but well-substantiated new ideas.

These are the conclusions of Dr. I. Bernard Cohen, Harvard expert in the history of science and one of a panel of five scientists who discussed "Some Unorthodoxies of Modern Science" at the meeting of the American Philosophical Society in Philadelphia.

They discussed Dr. Immanuel Velikovsky's theories of worlds in collision and ages in chaos, dowsing or the finding of water through use of a forked stick, and extra-sensory perception.

None of the scientists agreed with any of the unorthodoxies or even with the methods by which the unorthodox try to prove their theories. But in opening the meeting, Dr. Cohen pointed out that most of the great revolutionary scientific theories, hypotheses and even announcements of new effects have met with hostility on the part of those who preferred to cling to existing modes of thought.

This does not mean, however, Dr. Edwin G. Boring, Harvard psychologist, declared, that orthodoxy must be swept aside.

"Orthodoxy in science at any moment in the history of science," he declared, "is the agreement of the experts . . . When observations conflict, then scientific truth has for the time being to be set in accordance with the weight of the evidence, for you have to suspend judgment about an unorthodox belief when that belief contradicts a large body of accepted consistent scientific fact."

Dr. Cohen praised the "inertia of orthodoxy" as a legitimate hurdle which acts as a screen permitting only useful and well substantiated ideas to pass. There may be delays in this method, he said, but there would be difficulty in conceiving the true progress of the sciences without the restraining bond of orthodoxy.

Dr. John L. Kennedy, senior social scientist of the Rand Corporation, Santa Monica, Calif., discussed extra-sensory perception and found many problems of experimental control in the work at Duke University. His paper was read by Dr. Leonard Carmichael, president of Tufts College and new secretary of the Smithsonian Institution.

Dr. Cecelia Payne-Gaposhkin, Harvard astronomer, discussed the Velikovsky hy-

pothesis. Her paper was read by Dr. Donald H. Menzel, professor of astrophysics at Harvard.

Dr. Thomas M. Riddick, consulting engineer and chemist of New York, concluded about dowsing that it does not seriously threaten to shake the present foundations of society.

Science News Letter, May 3, 1952

VOLCANOLOGY

Volcano Collapsed 25,000 Years Ago

► A COLLAPSED volcano is the cause of the mile-wide hole in the earth's surface known as Crater Elegante, about 30 airline miles south of the Arizona border in northern Sonora, Mexico.

The vast rock heap shuddered and fell into the earth like a piston dropping in an almost circular cylinder, Dr. Richard H. Jahns, geologist at the California Institute of Technology, Pasadena, reported.

The history of the volcano, which disappeared from the skyline possibly some 25,000 years ago, is written on the walls of the huge circular cavity and was reconstructed by Dr. Jahns. The crater is about a mile in diameter and the maximum depth of its flat floor is 800 feet.

Conspicuous on its walls is a great thickness of cliff-making basalt, a dark fine-grained rock of volcanic origin. Above the basalt flows are black and red cinders topped by sedimentary beds.

Science News Letter, May 3, 1952

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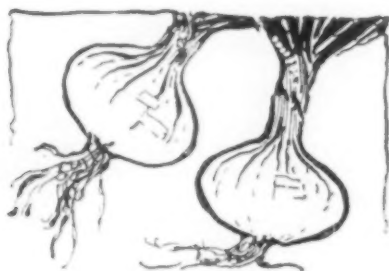
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Onions

► THE DEMAND for onion sets during the past weeks has been brisk and increasing, and many ordinarily fastidious fathers of families have dirt under their fingernails when they come in to dinner in the evening. But in a few weeks they will be joyously redolent of green onions of their own raising.

Onions are among the oldest of herbs used by man for food. This is probably partly due to the fact that even in the wild state the bulbs are large enough to repay the labor of gathering, and partly because their pungent taste appealed to primitive

man as a seasoning for his not always highly palatable food.

At any rate, onions, shalots, leeks, and above all garlic, figure in all recorded feasts since the servants of Cheops carved hieroglyphs on the stones of the pyramids.

The common garden onion has been so long cultivated that it is not found today in the wild state. The onion genus, *Allium*, includes 300 widely distributed species, of which the bulbs are made up of many successive papery coats or layers of leaf bases, and the slender tapering leaves have the familiar onion or leek taste. When in blossom, onions bear white or pink flowers in compact umbels.

Onion sets are obtained in several different ways. They may simply be small onions grown from seed during the previous season, and allowed to continue their growth. They may be "bottom sets" of the shalot or "multiple onion" type, wherein the parent onion, instead of growing as a single large bulb, has grown as a cloven group of small ones, which may be broken apart into individual units for planting.

Or they may be "top sets," the offspring of flower-stalks of onions which, instead of bearing normal flowers and seeds, have produced these little bulbils instead.

Onions were formerly the great stand-by in sailing ships on long voyages for the prevention of the dreaded disease, scurvy. We know now that the onions were valuable because of a certain vitamin. It is probably a sort of mild incipient scorbutic tendency that causes many of us, after a long winter season, to hanker for succulent spring onions.

Science News Letter, May 3, 1952

NUTRITION

Health Aids from Gardens

► HOME GARDENS, which many families are starting now, can help your health in three ways.

One is through the better nourishment provided when food budgets are limited. Two is through the increased outdoor exercise. Three is through the lift in morale that comes from growing and harvesting your own food crop, however small.

In deciding what vegetables and fruits to plant, be guided by the Basic Seven food plan. This plan divides the foods we eat into seven groups according to their nourishing qualities. Nutrition-conscious housewives follow it in planning the family meals.

One group is made up of the foods that can be the mainstay of the diet for vitamin A. This includes green, yellow and leafy vegetables such as spinach, kale, green peas, lima beans, snap beans and carrots. And you eat one or more servings from this group each day.

Two others of the Basic Seven food groups can come from the family garden. One of these is the vitamin C rich foods

from which one or more daily servings should be eaten. You can't, unless you live in Florida or California, have oranges and other citrus fruits in your garden, but you can have such other vitamin C fruits as melons and strawberries. And you can have tomatoes, cabbage, turnips, salad greens, and green peppers. Any of these provide vitamin C when served raw and tomatoes provide it raw or canned.

The third Basic Seven group that can come from the home garden is a catch-all group. It includes potatoes, beets, onions, turnips and radishes. These foods do their part in nourishing you by adding to the supply of various vitamins, minerals and other materials the body needs. Some of them add flavor that makes you want more of the other foods. Beets and turnips yield double harvests in their roots and their fresh green tops. You can add the green tops to your leafy vegetable group. Two or more daily servings from this third group are called for in the Basic Seven plan.

Science News Letter, May 3, 1952

GENERAL SCIENCE

Scientist Should Preach What He Practices

► "THE SCIENTIST should preach what he practices," Dr. C. I. Lewis, Harvard philosophy professor, told a meeting of the American Philosophical Society in Philadelphia.

The same methods which the scientist uses to decide between what are scientific findings of fact and what is unscientific and unacceptable should be used by the scientist to decide what course of action should be taken as a result of scientific findings, he said.

However, the scientist is ducking the responsibility of choosing what kind of action to take once he has made a scientific discovery, Dr. Lewis charged. This currently dominant conception of science is belittling to ethics, he said.

A scientific discovery is in itself a reason for action and invites action, Dr. Lewis pointed out. The choice of action based on the discovery is not merely rational, an ethically good or bad choice can be made, and it can be made in the same manner a scientist uses to choose between scientific fact and fiction.

Science News Letter, May 3, 1952

TECHNOLOGY

Nickel-Plated Aluminum Cuts Propeller Wear

► A SYNTHETIC rubber compound has been developed to bind nickel to aluminum to reduce pitting and corrosion of airplane propellers from the spray kicked up by landings and take-offs from the sea.

The process was described by S. G. Bart, president of Bart Laboratories, East Hartford, Conn., which developed the process jointly with the United Aircraft Corporation for the U. S. Air Force and Navy. It solves a major problem by producing a stress-free, hard, yet resilient coating for aluminum which is commonly used in airplane propellers because of its strength and lightness.

The bond between the synthetic rubber base and the nickel will stand up under a wide range of temperatures. Its hardness was found satisfactory when nickel-plated propellers were unharmed by severe laboratory tests, whereas standard unplated blades lost about 20% of their tip area during the tests.

In treating aluminum with nickel, the bond material first is sprayed on the aluminum and allowed to dry. The sprayed piece then is plated with nickel by conventional means. Mr. Bart said the entire process required approximately 24 hours to complete.

Some of the Navy's Martin P5M-1 flying boats and Grumman UF-1 utility amphibians already are equipped with the nickel-plated propeller blades.

Science News Letter, May 3, 1952

SENIORS OF 1953

Start Now on YOUR SCIENTIFIC PROJECT

TO WIN in the *Twelfth* ANNUAL

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- 1 Pick a subject that you can investigate at first-hand, preferably one about which you can do more than just read. Typical projects of Science Talent Search winners have been in such fields as Aeronautics, Agriculture, Astronomy, Botany, Chemistry, Electronics, Geology, Mathematics, Meteorology, Medical Sciences, Nutrition, Photography, Physics, Psychology, Radio, and Zoology.
- 2 Whatever your project may be—read about it. Learn what has already been done. It is often desirable to repeat previous experiments, but it should be done deliberately and for a purpose.
- 3 Write what you did, not merely what you read. Tell it in simple language; follow it through step by step. Then tell what you observed as a result of your experiments, and what conclusions you draw from these observations.
- 4 Fancy writing has no place in science. There has been great writing in the sciences but it is the greatness of strength and simplicity.

WRITE A REPORT of about 1,000 words on the subject, "MY SCIENTIFIC PROJECT." Your report should tell what you are doing or plan to do in science in the way of experimentation or other research activity. It should be original and creative in character. Now, before the school year ends, is the time for high school seniors of 1953 to get started on science projects. With an early start you can plan a project, carry it through more carefully, write a better report on it. Next December take an examination which tests your ability rather than your fund of information. Supply your school with information about yourself to be sent in with your report and examination papers.

Do these three things and you may be among the forty boys and girls who will win all-expense trips to the Science Talent Institute and compete for scholarships for the continuation of your education. Of the forty, one will be selected as winner of the \$2,800 WESTINGHOUSE GRAND SCIENCE SCHOLARSHIP; another as winner of the \$2,000 WESTINGHOUSE GRAND SCIENCE SCHOLARSHIP; eight more of the forty boys and girls will be selected to receive WESTINGHOUSE SCHOLARSHIPS of \$400 each; and \$3,000 more in WESTINGHOUSE SCHOLARSHIPS will be awarded at the discretion of the judges. Every one of the forty boys and girls will, when in Washington, be awarded the GOLD EMBLEM OF SCIENCE CLUBS OF AMERICA.

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ANNUAL REPORT FOR THE YEAR 1951—Conservation Foundation, 35 p., paper, free upon request to publisher, 30 East 40th St., New York 16, N. Y. Describing the year's activities and current research projects.

ARCTIC COLD FRAMES FOR NORTHERN CLIMATES—Basil M. Bensin—*Bensin*, 5 p., illus., paper, 30 cents. With these instructions you can make your own cold frames with solar reflectors for your Alaskan garden.

ARCTIC GARDEN SOLAR REFLECTORS AND RADIATORS FOR NORTHERN CLIMATES—Basil M. Bensin—*Bensin*, 7 p., illus., paper, 30 cents. Growing vegetables and flowers in Alaska requires making the most of the sun's light and heat. Here are directions for making simple reflectors of inexpensive materials for warming the soil and air around the plants.

ARRANGING FLOWERS FROM THE ROADSIDE, FIELDS, AND WOODS—Amelia Leavitt Hill—*Studio*, 151 p., illus., \$3.85. An attractive book for enthusiasts for this hobby. It includes useful lists of flowers available in the countryside and of "Forbidden Fruit," rare species which you should not pick.

ATLAS OF FRAMBOESIA: A Nomenclature and Clinical Study of the Skin Lesions—Kenneth R. Hill, R. Kodijat and M. Sardadi—*World Health Organization (Columbia University Press)* 18 p., illus., paper, \$1.00. Describing in photographs the skin manifestations of framboesia (yaws), thus making clear the meaning of the various names of such conditions.

CARDIOLIPIN ANTIGENS: Preparation and Chemical and Serological Control—Mary C. Pangborn and others—*World Health Organization (Columbia University Press)* 63 p., illus., paper, \$1.00. Cardiolipin antigens, used in serological tests for syphilis, are mixtures of sodium cardiolipin with purified lecithin and usually also with cholesterol.

COAL DUST FOR ALASKAN GARDENS—Basil M. Bensin—*Bensin*, 9 p., illus., paper, 30 cents. The coal dust serves to remove snow and warm the soil by absorbing the rays of the sun.

THE EXECUTIVE AND HEALTH: Transactions of the Sixteenth Annual Meeting—Industrial Hygiene Foundation of America, 89 p., illus., paper, \$1.50. Discussing measures which would keep men in key positions healthy. Suggesting "Well Adult Clinics" and periodic examinations.

FLORIDA BIRD SONGS—P. P. Kellogg and A. A. Allen—*Comstock*, 1 disk, 10 in., 78 r.p.m., \$2.50. Made for the Brand Bird Song Foundation by aiming a sensitive microphone at the birds, collecting the sound waves by a parabolic reflector and recording them on magnetic tape. Calls of five familiar and five rare birds, including the Ivory-billed Woodpecker are so recorded.

FOLIC ACID CONTENT OF FOODS: Microbiological Assay by Standardized Methods and Compilation of Data From Literature—Edward W.

Toefer, Elizabeth Gates Zook, Martha Louise Orr, and L. R. Richardson—*Govt. Printing Office, Agriculture Handbook No. 29*, 116 p., paper, 45 cents. Giving the folic acid content of 160 familiar foods. Best sources include: Brewer's yeast, liver, asparagus, endive, broccoli, lettuce and spinach.

FORGING AND FORMING METALS—S. E. Rusinoff—*American Technical Society*, 279 p., illus., \$3.95. To give employees in the metal industry better know-how.

MECHANICS OF FLUIDS—Glenn Murphy—*International Textbook Company*, 2d ed., 309 p., illus., \$6.00. The book includes a series of laboratory and design problems and puts the emphasis on principles governing behavior of fluids at rest and in motion.

MILITARY MEDICAL MANUAL—Military Service Publishing Company, 7th ed., 761 p., illus., \$5.75. Not an official volume but one prepared by military authors for the use of officers and enlisted men of the Army Medical Services.

PESTICIDE HANDBOOK 1952—Donald E. H. Frear, Ed.—*College Science Publishers*, 4th ed., 176 p., paper, \$1.25. Cloth, \$3.00. A directory listing over 4,400 trade-named pesticides.

RELIGIOUS BELIEFS OF AMERICAN SCIENTISTS—Edward LeRoy Long, Jr.—*Westminster Press*, 168 p., \$3.00. A Presbyterian minister infers from the writings of contemporary scientists what their religious beliefs are.

REPORT OF THE COMMITTEE ON THE MEASUREMENT OF GEOLOGIC TIME 1950-1951—John Putnam Marble, Chairman—*National Academy of Sciences—National Research Council*, 140 p., paper, \$1.00.

TIDAL DATUM PLANES—H. A. Marmer—*Govt. Printing Office*, C. and G. Survey Special Publication No. 135, rev. ed., 142 p., illus., paper, 60 cents. Planes of reference for elevations, based on the rise and fall of the tide, have the advantage of certainty of recovery even though all bench-mark connection be lost. Prepared as a manual for C. and G. Survey.

Science News Letter, May 3, 1952

INVENTION

No More Street Car Poles With New Invention

► **TROLLEY WIRES** and poles may become a thing of the past if a Swiss invention is generally adopted. An electric vehicle which can pick up and store electrical energy received patent 2,589,453 from the U. S. Patent Office.

The motor, invented by Bjarne Storsand of Zurich, has a fly wheel that weighs about 10% of the total weight of the vehicle.

Science News Letter, May 3, 1952

RADIO

Saturday, May 10, 1952, 3:15-3:30 p.m. EDT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Winners of the Third National Science Fair will be interviewed and prizes awarded from the Exhibition Hall, U. S. National Museum in Washington, D. C.

TECHNOLOGY

Woodpecker "Ring" for Front Line Voice Phone

► A TELEPHONE that imitates a woodpecker when it "rings" has just been approved for production, the U. S. Army Signal Corps announced in Fort Monmouth, N. J.

The woodpecker device can be adjusted in volume to prevent giving away the positions of front-line soldiers. The pecking noise, however, can be heard more easily and about twice as far in battle noise, the Army reported.

Sensitive enough so that it can detect the softest whisper, yet rugged enough to withstand the powerful shock waves of heavy artillery, the waterproof phone normally works on two flashlight cells. It will transmit messages up to five miles without any source of power other than the speaker's voice.

The size of a loaf of bread, the field telephone weighs about eight and a half pounds, works in temperatures from 130 to minus 63 degrees Fahrenheit, and can be hooked into central office systems.

Science News Letter, May 3, 1952

MEDICINE

Muscle Weakness Treated With Soapless Soap Relative

► A NEW approach to treatment of the muscle weakness disease, myasthenia gravis, is promised by a chemical related to the synthetic detergents, or soapless soaps, and named Tensilon, or, chemically, 3-hydroxyphenyl dimethylethylammonium chloride.

Tensilon injected into the veins of patients with myasthenia gives a prompt though not lasting increase in strength, Drs. Martha R. Westerberg, Kenneth R. Magee and Frederick E. Shideman of Ann Arbor, Mich., reported to the American Academy of Neurology in Louisville, Ky.

Even patients already on treatment with neostigmine or other medicine for myasthenia gain extra if transitory strength from the Tensilon injection.

The effect of the drug is a direct stimulation at the nerve-muscle junction and is not related to any anticholinesterase activity. For this reason, the Michigan doctors consider it holds promise of a new approach in both treatment and study of the disease.

Science News Letter, May 3, 1952

MEDICINE

Brucellosis Test Devised

Method for diagnosing brucellosis in humans worked out using dots on paper treated with suspected serum. Disease ranks with TB in importance.

► A SIMPLE new test for the diagnosis of brucellosis in humans, easy to perform and accurate in a high percentage of cases, has been devised by Dr. Maximiliano Ruiz Castaneda, head of the Mexican Brucellosis Center of the World Health Organization in Mexico City.

Working in a modest laboratory in Mexico City, Dr. Ruiz Castaneda is one of the world's authorities on brucellosis, a mystery disease with many names: undulant fever, Malta fever, and milk fever. It often escapes diagnosis, for symptoms are confused with typhoid, malaria and tuberculosis. Or in less severe forms where the patient merely suffers from a general "not feeling well," it's dismissed as psychoneurosis.

The new test, the last of several developed by Dr. Ruiz Castaneda, is called the surface fixation test. It consists of testing suspected serum on a small square of filter paper at the bottom of which are three black dots. The dot on the left represents the positive reaction, and the one on the right the negative reaction. These are controls for the central dot on which the technician places the serum to be tested. The sheet is then suspended over a salt solution with the lower margin in the solution. As the liquid is absorbed by the paper, like blotting paper, the coloring matter in the negative reaction dot is diffused upward in a comet-shaped line, the positive reactor remaining a dot.

The presence of the disease is determined by the action of the central dot with the patient's blood compared to the negative and positive reactors and thus not only

establishes the presence of the bacillus but the degree of infection.

In preparing the negative control dot Dr. Ruiz Castaneda has tried out a variety of substances to substitute for normal blood because after several days it is not soluble when moistened by the saline solution and thus will not travel upward on the filter paper.

To date, the only substance which he has found that reacts like normal blood and yet remains soluble for at least three months is a liquid extracted from the maguey cactus, from which pulque, an intoxicating drink, is made.

That brucellosis ranks with tuberculosis, syphilis and pneumonia in importance and incidence is not generally known. The brucella bacillus can be the cause of results as varied as arthritis, osteomyelitis, "muscular rheumatism," skin lesions, chest pains, colitis, generalized weakness, weight loss and pelvic pain.

For these reasons it has been imperative to find simple, effective tests which would demonstrate the presence of the bacillus in the body. The agglutination and skin tests which have been used for many years are not positive in a sufficient number of cases, and have the further disadvantage of not being standardized in either procedure or reading.

Dr. Castaneda reported on the problem of brucellosis to the joint Mexican-American Border Health Commission which met in Monterrey, Mexico.

Science News Letter, May 3, 1952

METALLURGY

Titanium Kit Available

► A SAMPLE of shiny titanium metal and materials to demonstrate how it was made can now be obtained.

A few years ago only a few pounds of titanium metal were in existence as laboratory curiosities. But demand for this promising metal for defense purposes and development of better processing methods have upped production so that this year several thousand tons are expected to be produced.

Most of the titanium production, however, is earmarked for defense use and experimental purposes. The current price is \$5.00 per pound for sponge titanium in lots of 100 pounds or more, and \$11.00 to

\$25.00 per pound for forgings, plate, sheet and strip titanium. Thus, a sample of titanium sheet is as valuable as if it were silver.

Titanium is valued for its great strength and light weight. It is about twice as heavy as aluminum, but almost three times as strong. It weighs about half as much as steel and is as strong as many steels. It is considered most promising for use in airplane frames.

The metal is resistant to oxidizing, chlorine and chloride reagents, suggesting great usefulness for chemical equipment. Titanium resists corrosion better than aluminum, stainless steel and all other met-

als and alloys generally used in marine construction.

Titanium is the ninth most common element in the earth's crust and the fourth most abundant structural metal, yet it is never found in pure form. Always combined with other elements, getting the pure metal from its ores is a major scientific challenge for chemists and metallurgists.

Common as titanium is, there are few ores from which it is commercially practical to extract the metal.

Few people in the world have seen and handled sponge titanium and sheet titanium such as are contained in the kit which SCIENCE SERVICE has collected for you. Black ilmenite sand such as that from which these particular samples were made is also contained in the attractive display box which is the current unit of monthly THINGS of science. It is available for the nominal sum of 75 cents. Just write SCIENCE SERVICE, 1719 N St., N.W., Washington 6, D. C., and ask for the Titanium Kit.

Science News Letter, May 3, 1952

MEDICINE

New Two-Way Bandage Stretches Around Joints

► A TWO-WAY-STRETCH cotton bandage that will fit neatly around knees, elbows and finger joints without being too constricting is now going into commercial production for the Armed Forces and may soon be available for civilian use.

The bandage was developed by the U. S. Department of Agriculture's Southern Regional Research Laboratory and has undergone tests in military hospitals in the United States and field hospitals in Korea.

The fact that it can be adapted readily to irregular contours of the body is its outstanding feature. This is achieved by a simple chemical treatment with caustic soda and subsequent neutralization. The treatment preshrinks ordinary open-weave gauze in a way that gives it a kind of permanent wave. The resulting kinkiness and crimp of the yarns gives the bandage elasticity in two directions. It is therefore essentially self-fitting and self-tightening.

Science News Letter, May 3, 1952

WANTED—IDEAS

For converting scrap leather into a saleable product—for industry, home, office, etc. Tons of this leather discarded annually. Experienced leather man feels much of this scrap could be utilized. A package will be sent to you for \$1.00 to experiment with. Your rights protected in any successful development.

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✿ **PLASTIC PISTOL** grip for the Smith and Wesson police revolver has been developed as a replacement for the standard grip. Molded with a storage chamber for six additional cartridges, the shatterproof grip is knurled to insure a steady grasp.

Science News Letter, May 3, 1952

✿ **RELATIVE HUMIDITY** device, designed for the armed forces, makes it no longer necessary to break open and reseal a sample of stored packages to check for corrosion. A small moisture detector sealed inside the package yields a direct relative-humidity reading on a meter through an air-tight electric connection.

Science News Letter, May 3, 1952

✿ **HEAT-ABSORBING GLASS**, also designed to reduce glare and to produce "filtered daylight" for commercial and industrial buildings, consists of a decorative surface made of a finely textured light-diffusing pattern. The new glass is to be made available in one-eighth and one-quarter inch thicknesses.

Science News Letter, May 3, 1952

✿ **TELEPHONE DIAL** light, which goes on when the receiver is lifted, fits flush against the side of the telephone case. It becomes a night light when a switch is thrown. Made of a phenolic plastic, the device has a translucent tab on which emergency numbers can be written.

Science News Letter, May 3, 1952

Do You Know?

Exploding coal dust exerts a tremendous pressure, sometimes approaching 20,000 pounds per square foot.

There are four different kinds of horns among mammals: hollow horns, pronghorns, keratin-fiber horns and antlers.

Salamanders are tailed amphibians resembling lizards in shape but actually related to frogs rather than lizards.

Enough *milk* is produced annually in America to fill a river 3,000 miles long, 40 feet wide and 3 feet deep.

The two most poisonous *snakes* in the world are said to be the tiger snake of Australia and the island viper which is found on a small island off the coast of Brazil.



✿ **PLASTIC COLLAR** stays for men's shirts have a transparent adhesive backing which allows them to be stuck directly to the fabric, as shown in the photograph. Almost two and one-half inches long, the

temperature- and humidity-resistant stays can be cut easily to the proper length and reused.

Science News Letter, May 3, 1952

✿ **TRANSPARENT PLASTIC** basket now is being used to package scarfs, hosiery, handkerchiefs and toiletries. A flexible handle runs through holes in the basket lid allowing the container to be opened without losing the cover.

Science News Letter, May 3, 1952

✿ **COSTUME NEEDLE** recently developed enables the amateur seamstress to do cording of any size, bias loops for button holes, frog fasteners and spaghetti trimmings.

Science News Letter, May 3, 1952

✿ **PHOTOFLASH TEST** bulbs, now available in two sizes and the corresponding flash-lamp voltage ratings, are designed for checking the batteries, sockets and wiring connections of camera synchronizer assemblies. Because the bulbs work directly in flashbulb sockets, adapters are not required.

Science News Letter, May 3, 1952

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